



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/924,961 | 08/08/2001 | Carl M. Hoffmaster | 05516.089001 | 1995 |

22511 7590 07/12/2005

OSHA LIANG L.L.P.
1221 MCKINNEY STREET
SUITE 2800
HOUSTON, TX 77010

EXAMINER

DANG, HOANG C

ART UNIT PAPER NUMBER

3672

DATE MAILED: 07/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MAILED

JUL 12 2005

GROUP 3600

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/924,961
Filing Date: August 08, 2001
Appellant(s): HOFFMASTER ET AL.

Jonathan P. Osha
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 25, 2005 appealing from the Office action mailed May 4, 2004.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

20

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 132, 133, 134, 135, 139, 140 and 150 are rejected under 35 U.S.C. 102(b) as being anticipated by McGarian et al (US 5,853,054).

Claim 132, the only independent claim on appeal, is reproduced below:

An expandable reaming tool, comprising:
at least two reamer pads operatively coupled to a tool body and adapted to be displaced between a retracted position and an expanded position;
at least one blade formed on each of the at least two reamer pads;
a plurality of cutting elements disposed on the blades,
wherein selected ones of the plurality of cutting elements disposed on one of the at least two reamer pads are positioned to contact a wellbore at a substantially same axial location as other selected ones of the plurality of cutting elements so as to form a redundant cutting arrangement.

Claim 132 reads on the McGarian et al reference as follows:

An expandable reaming tool (1) comprising:

Art Unit: 3672

at least two reamer pads **(6A and 6B, figures 1 and 5)** operatively coupled to a tool body **(2)** and adapted to be displaced between a retracted position **(figure 2C)** and an expanded position **(figure 1 or 5)**;

at least one blade (“wear resistant member” **52** shown in **figures 6-8; column 6, lines 1-18**) formed on each of the at least two reamer pads **(6A, 6B)**;

a plurality of cutting elements **(column 6, lines 19-56)** disposed on the blades **(52)**,

wherein selected ones **(elongated bars 54 or inserts 58 on 6B)** of the plurality of cutting elements disposed on one of the at least two reamer pads are positioned to contact a wellbore at a substantially same axial location as other selected ones **(elongated bars 54 or inserts 58 on 6A)** of the plurality of cutting elements so as to form a redundant cutting arrangement.

It is noted that since “cutting elements” 54 or 58 on both blades 6A and 6B extend substantially the entire length of gauge zone D on their associated blade, and since blades 6A and 6B are symmetrically arranged on the tool body 1, therefore, “cutting elements” 54 on blade 6B contact the wellbore at a substantially same axial location as that of “cutting elements” 54 or 58 of blade 6A and thus forming a redundant cutting arrangement of “cutting elements” 54 or 58 of blade 6A as claimed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 143, 145, 146 and 149 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGarian et al '054.

As for claim 143, McGarian et al disclose the invention as claimed except it does not disclose the size of the cutting elements. However, it would have been obvious to use cutting elements having the size in the claimed range since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As for claims 145, 146 and 149, McGarian et al disclose the invention as claimed except that McGarian et al do not disclose the material of the pads and/or blades. However, it would have been obvious to use the material as claimed since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

5. Claims 132, 133, 134, 135, 139, 140, 143, 145, 146, 148, 149 and 150 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGarian et al (US 5,853,054) in view of Mensa-Wilmot et al (US 6,607,025).

McGarian et al disclose the invention as claimed (see figures 1, 2, 5-9 and column 5, line 51 through column 7, line 17) except for the "redundant" cutters. It appears from figures 1, 2 and 5-9 of McGarian et al that at least some redundant cutting do occur due to the symmetrically arrangement of the cutter blades 6A and 6B and numerous cutting elements provided on these blades. In any event, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide McGarian et al with "redundant cutters" as claimed in view of the

Art Unit: 3672

teaching of Mensa-Wilmot et al in order to increase the durability and life of the underreamer (see column 12, lines 6-29).

As for claim 143, it would have been obvious to use cutting elements having the size in the claimed range since such a modification would have involved a mere change in the size of a component (especially in view of the extremely broad claimed range). A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As for claims 145, 146 and 149, it would have been obvious to use the material as claimed since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

6. Claims 136 and 147 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGarian et al in view of Mensa-Wilmot et al '025 as applied to claim 132 above, and further in view of Hansen et al (US 5,979,576) or Griffin et al (US 6,142,250).

McGarian et al as modified by Mensa-Wilmot et al '025 disclose the invention as claimed except for the presence of a "vibration damping insert". However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide McGarian et al as modified by Mensa-Wilmot et al with a vibration damping insert as claimed because it is well known in the well drilling art to provide such an insert to enhance the stability of the drill bit or to minimize bit whirl as evidenced by Hansen et al (see column 6, lines 19-26) or Griffin et al (see column 5, lines 41-51).

Art Unit: 3672

As for claim 147, it is conventional in the art to mount cutting elements such that the cutting element exposure is more than half of a diameter of the cutting element as evidenced by either Hansen et al or Griffin et al.(see cutting elements in the drawings of these patents)

7. Claims 137, 138 and 144 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGarian et al in view of Mensa-Wilmot et al '025 as applied to claim 132 above, and further in view of Beaton et al (US 6,269,893) or Huang et al (US 6,516,293).

McGarian et al as modified by Mensa-Wilmot et al disclose the invention as claimed except that the cutting elements are not disclosed as being arranged such that the axial force, lateral force or mass is balanced. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange cutting elements of McGarian et al as modified by Mensa-Wilmot et al so as to have the axial forces, lateral forces or/and mass balanced as claimed in view of the teaching of Beaton et al (see column 5, line 32 through column 6, line 10) or Huang et al (see column 13, lines 51-61) in order to improve drilling stability or/and drilling performance.

8. Claims 141 and 142 are rejected under 35 U.S.C. 103(a) as being unpatentable over McGarian et al in view of Mensa-Wilmot et al '025 as applied to claim 132 above, and further in view of Mensa-Wilmot et al (US 6,164,394).

McGarian et al as modified by Mensa-Wilmot et al '025 disclose the invention as claimed except for the recited range of the backrake angles. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the angles in the claimed range or use cutting elements having different backrake angles because Mensa-Wilmot et al '394

Art Unit: 3672

teach using cutting elements having different backrake angles and using backrake angles within the claimed range to enhance drilling performance (see column 10, lines 34-35).

(10) Response to Argument

A. The rejection of claims 132-135, 139, 140 and 150 under 35 U.S.C. 102 (b) as being anticipated by McGarian

Contrary to appellant's argument that McGarian does not disclose all three of the limitations relating to a pad, blade and a cutting element recited in claim 132, McGarian discloses all of the elements called for in claim 132 when members (1), (6A and 6B), (52, figs 6-8, col. 6, lines 1-18), (54, col. 6, lines 19-56), (54 on 6B) and (54 on 6A) of McGarian are respectively considered as "expandable reaming tool", "reamer pads", "blades", "plurality of cutting elements", "selected ones of the plurality of cutting elements disposed on one of the at least two reamer pads" and "other selected ones of the plurality of cutting elements" as recited.

Contrary to appellant's argument, the "pads" as defined by claim 132 clearly do not distinguish from blades (5A/B, 6A/B) of McGarian. Similarly, the "blades" as defined by claim 132 clearly do not distinguish from wear resistant elements 52 shown in Figures 6-9 and disclosed in column 6, lines 1-18. These wear resistant elements 52 of C-shaped configuration are secured to "pads" (5A/B, 6A/B) by brazing.

The "plurality of cutting elements" as defined by claim 132 similarly do not distinguish from elongated bars 54 or tungsten carbide inserts 58 that are provided on zone D of wear resistant elements 52 of "pads" (5A/B, 6A/B). Contrary to appellant's that McGarian does not disclose "cutting elements" on wear resistant members 52, McGarian discloses that the gauge

Art Unit: 3672

face D of wear resistant member 52 is provided with elongate bars 54 of suitable material, for example thermally stable polycrystalline diamond or tungsten carbide (column 6, lines 35-37) and that elongate bars 54 do perform a cutting action (column 6, line 38). Similarly, McGarian also disclose that the tungsten carbide inserts 58 provide “cutting action” (column 7, lines 5 and 17).

Redundant Cutting Arrangement

Contrary to appellant’s argument that the elongate bars 54 or tungsten carbide inserts (58) of McGarian, like gage inserts, are not cutting structures, McGarian clearly disclose that they are cutting structures. Appellant’s attention is directed to column 6, lines 37-39 where McGarian discloses that “[t]he bars are set proud of the gauge face to ensure a cutting or cleaning action” or in column 7, lines 3-6 that “[b]oth tungsten carbide inserts 58 and diamond inserts 57 in the gauge face D are set proud of the metal in which they are embedded to provide raised cutting and wear resistant surfaces” and again in column 7, lines 15-17 that “in the gauge face D the inserts are arranged proud of the material in which they are embedded to provide optimum cutting action and wear resistance.”

With regard to the “redundant cutting arrangement” limitation, contrary to appellant’s argument and Item 7 of the Declaration of Graham Mensa-Wilmot, in the embodiment of Figures 6-8 of McGarian et al, cutting elements 54 of blades 6B contact the borehole at a substantially same axial location as that of cutting elements 54 of blades 6A, therefore, cutting elements 54 of blades 6B inherently form a redundant cutting arrangement of cutting elements 54 on blades 6A as claimed. Similarly, in the embodiment of Figure 9, cutting elements 58 of blades 6B contact the borehole at a substantially same axial location as that of cutting elements 58 of blades 6A,

Art Unit: 3672

therefore, cutting elements 58 of blades 6B inherently form a redundant cutting arrangement of cutting elements 58 on blades 6A as claimed.

B. The rejection of claims 143, 145, 146 and 149 under 35 U.S.C. 103(a) as being unpatentable over McGarian et al '054

Appellant did not present any separate argument for this rejection. The rejection of claims 143, 145, 146 and 149 will stand or fall with claim 132 from which they depend.

C. The rejection of claims 132-135, 139, 140, 143, 145, 146 and 148-150 under 35 U.S.C. 103(a) as being unpatentable over McGarian et al '054 in view of Mensa Wilmot et al (US 5,607,025)

Whether the combination of McGarian and Mensa-Wilmot '025 make up for the deficiencies of McGarian alone

Appellant's argument that McGarian fails to anticipate claim 132 has been fully responded by the examiner above in Item A.

Whether McGarian is properly combinable with Mensa-Wilmot '025

Appellant and the declaration (Item 10) contend that the references are not properly combinable because Mensa-Wilmot '025 is directed to a drill bit whereas McGarian is directed to an under-reamer.

First of all, what is relied on in the Mensa-Wilmot reference is a general teaching of providing redundant cutters to increase the durability and life of a drill bit. This general teaching, namely, "[r]edundant cutters increase the durability and life of the bit 10 by increasing the

Art Unit: 3672

diamond density,” (column 12, lines 6-18) is a common knowledge of providing a device with redundant work-performing elements to increase its durability and service life (but at a higher cost), should not be limited to certain technology areas, much less to only certain types of drill bits.

Secondly, although the drill bit of Mensa-Wilmot and the underreamer of McGarian have different roles as pointed out by appellant and in Item 10 of the declaration, i.e., one for creating a borehole and the other for enlarging a previously drilled hole, both the drag-type drill bit of Mensa-Wilmot and the under-reamer of McGarian have a lot in common. They both use fixed cutters. They both have some cutters that cut the bottom and some cutters that cut the sidewall. Most important, the cutters of the Mensa-Wilmot bit and the cutters of the McGarian under-reamer cut the formation by the same mode or principle - shearing formation material. In view of these common features, one skilled in the art would have readily recognized that the teaching related to cutters in Mensa-Wilmot '025 could equally be applied to cutters in McGarian.

With respect to appellant's argument that there is no motivation to combine McGarian and Mensa-Wilmot, appellant's attention is directed to column 12, lines 14-15 in Mensa-Wilmot '025 where it discloses “[r]edundant cutters increase the durability and life of the bit 10 by increasing the diamond density”. The motivation is therefore the increased durability and longer life of the underreamer.

Regarding appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed

Art Unit: 3672

invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

D. The rejection of claims 136 and 147 under 35 U.S.C. 103(a) as being unpatentable over McGarian in view of Mensa-Wilmot '025 and further in view of either Hansen et al (US 5,979,576) or Griffin et al (US 6,142,250)

Appellant's argument is that it is not proper to combine Hansen or Griffin with McGarian because as with Mensa-Wilmot '025, both Hansen and Griffin relate to drill bits whereas McGarian is directed to an underreamer.

Although the drill bit of Hansen or Griffin and the underreamer of McGarian have different roles as pointed out by appellant and in Item 10 of the declaration, i.e., one for creating a borehole and the other for enlarging a previously drilled hole, both the drag-type drill bit of Hansen or Griffin and the under-reamer of McGarian have a lot in common. They both use fixed cutters. They both have some cutters that cut the bottom and some cutters that cut the sidewall. Most important, the cutters of Hansen or Griffin and the cutters of McGarian cut the formation by the same mode or principle – by shearing formation material. One of ordinary skill in the art would have readily recognized that the stability of a drill bit or/and the avoidance of a bit whirl taught by Hansen et al or Griffin et al could equally be applied to the underreamer of McGarian because they both have a lot of common features as specified by the examiner above.

With respect to appellant's argument that there is no motivation to combine McGarian and Hansen or Griffin, appellant's attention is directed to column 5, lines 41-51 in Hansen et al

Art Unit: 3672

where it discloses that "... , thus resisting the tendency of the bit to tilt, cock or wobble in the bore hole" and column 6, lines 19-26 of Griffin et al where it discloses that "it may enhance the stability of the drill bit in the borehole and tend to inhibit the initiation of bit whirl." The motivation is therefore the stability of the bit or/and avoidance of bit whirl.

Regarding appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

E. The rejection of claims 137, 138 and 144 under 35 U.S.C. 103(a) as being unpatentable over McGarian in view of Mensa-Wilmot '025 and further in view of Beaton et al (US 6,269,893) or Huang et al (US 6,516,293)

Appellant's argument is that it is not proper to combine Beaton and Huang with McGarian because as with Mensa-Wilmot '025, both Beaton and Huang relate to drill bits whereas McGarian is directed to an underreamer.

Although the drill bit of Beaton and Huang and the underreamer of McGarian have different roles as pointed out by appellant and in Item 10 of the declaration, i.e., one for creating a borehole and the other for enlarging a previously drilled hole, one of ordinary skill in the art would have readily recognized that the improved drilling stability or/and performance by having

Art Unit: 3672

the axial forces, lateral forces or/and mass balanced taught by Beaton and Huang could equally be applied to the underreamer of McGarian because they both involve cutting a formation to form a borehole with cutters mounted on a drill string rotated from the earth surface.

With respect to appellant's argument that there is no motivation to combine McGarian and Beaton and Huang, appellant's attention is directed to column 5, line 32 through column 6, lines 10 in Beaton and column 13, lines 51-61 in Huang where they disclose the desire of having force balancing and/or mass balancing in order to provide improved drilling stability and performance. The motivation is therefore the enhanced drilling stability or/and performance.

Regarding appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

F. The rejection of claims 141-142 under 35 U.S.C. 103(a) as unpatentable over McGarian in view of Mensa-Wilmot '025 and further in view of Mensa-Wilmot (US 6,164,394)

Appellant's argument is that it is not proper to combine Mensa-Wilmot '394 with McGarian because as with Mensa-Wilmot '025, Mensa-Wilmot '394 relates to a drill bit whereas McGarian is directed to an underreamer.

Although the drill bit of Mensa-Wilmot '394 and the underreamer of McGarian have different roles as pointed out by appellant and in Item 10 of the declaration, i.e., one for creating a borehole and the other for enlarging a previously drilled hole, both the drag-type drill bit of Mensa-Wilmot '394 and the under-reamer of McGarian have a lot in common. They both use fixed cutters. They both have some cutters that cut the bottom and some cutters that cut the sidewall. Most important, the cutters of Mensa-Wilmot '394 and the cutters of McGarian cut the formation by the same mode or principle – by shearing formation material. One of ordinary skill in the art would have readily recognized that the enhanced drilling performance taught by Mensa-Wilmot '394 could equally be applied to the underreamer of McGarian because they both have a lot of common features as specified by the examiner above.

With respect to appellant's argument that there is no motivation to combine McGarian and Mensa-Wilmot '394, appellant's attention is directed to column 4, lines 34-36 of Mensa-Wilmot '394 that "[t]his provides an aggressive cutting structure for drilling through soft formations and provides the desired durability once harder formations are reached." The motivation is therefore the aggressive cutting action in softer formations and the durability in harder formations.

Regarding appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's

Art Unit: 3672

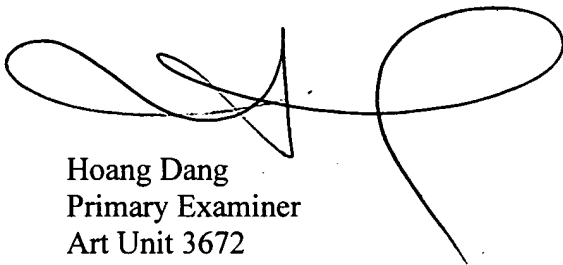
disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

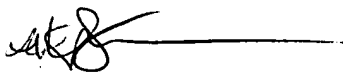
Respectfully submitted,



Hoang Dang
Primary Examiner
Art Unit 3672

Conferees:

Heather Shackelford



David Bagnell

